

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A micro-system for receiving beads of different diameters and obtaining a precise positioning of said beads at preset locations in said micro-system, comprising:

- a tank that has a cavity which is fitted with blocking elements having the form of columns, said blocking elements allowing ~~to block~~ beads of different diameters to be blocked and stacked in interstices between said blocking elements in an ordered way ~~and in stacks~~, said interstices constituting said preset locations, wherein said blocking elements are distributed so as to obtain a positioning of the beads as a function of their diameters and said blocking elements are distributed so as to constitute wells intended to receive beads of a first preset diameter and spaces between the wells intended to receive beads of a second preset diameter.
- a cap hermetically sealing said tank,
- and import means and output means allowing a fluid to flow in said cavity.

Claim 2 (Previously Presented): The micro-system according to claim 1, wherein said blocking elements are integral with the bottom of said cavity or said cap.

Claims 3-7 (Cancelled).

Claim 8 (Previously Presented): The micro-system according to claim 1, wherein said blocking elements have a transverse cross-section of a shape selected from among discs, ellipses and polygons.

Claim 9 (Previously Presented): The micro-system according to claim 8, wherein said blocking elements have a transverse cross-section in the shape of a hexagon.

Claim 10 (Currently Amended): The micro-system according to claim 1, wherein said blocking elements are of a height that allows at least two second diameter beads to be stacked in the interstices between the blocking elements.

Claims 11-12 (Cancelled).

Claim 13 (Previously Presented): A micro-reactor comprising the micro-system according to claim 1 and beads, with the same function but of different diameters, fitted between said blocking elements.

Claim 14 (Previously Presented): A micro-reactor comprising the micro-system according to claim 1 and beads, of different diameters and functions, fitted between said blocking elements.

Claim 15 (Withdrawn): A process for making the micro-system according to claim 1, comprising the following stages:

- forming, by micro-machining a substrate, the tank that has said cavity fitted with said blocking elements,
- supplying a cap intended to seal said cavity of said tank hermetically, and
- forming said fluid import means and said output means by micro-machining said tank and/or said cap.

Claim 16 (Withdrawn): The process according to claim 15, wherein said micro-machining is carried out by a process of dry or wet etching a material.

Claim 17 (Withdrawn): The process according to claim 15, wherein said micro-machining is carried out by impression moulding process.

Claim 18 (Withdrawn): The process according to claim 15, wherein said micro-machining is carried out by photolithography process.

Claim 19 (Withdrawn): A process for obtaining the micro-reactor according to claim 11, comprising filling functionalised beads in suspension in a liquid by sedimentation.

Claim 20 (Withdrawn): A process for obtaining a multi-functional micro-reactor, comprising filling the micro-system according to claim 3 with functionalised beads of one and the same diameter but with different functions, comprising:

- for beads functionalised according to a first function, the following stages:
 - a) placing a cover on said tank leaving accessible the part in which it is wished to place the beads of a first function,
 - b) filling by sedimentation, and
 - c) withdrawing said cover,
- for beads functionalised according to another function, the repetition, as many times as there are functions remaining, of stages a) to c) with beads of said other function, sealing said tank with said cap.

Claim 21 (Withdrawn): A process for obtaining a multi-functional micro-reactor by filling the micro-system, according to claim 4, with beads the function of which is related to the diameter of said beads, comprising at least two filling stages, the order of said filling stages corresponding to the decreasing order of the diameter of said beads.

Claim 22 (Withdrawn): A process for implementing a biochemical or biological reaction, comprising flowing a fluid stream in the micro-reactor according to claim 11, so that at least one constituent of said fluid stream reacts with pre-functionalised beads able to produce a chemical, electrochemical, biological or biochemical reaction, and at micro-reactor output(s) a fluid stream is collected that includes product(s) of said reaction.

Claim 23 (Withdrawn): The process according to claim 22, wherein said reaction is a reaction of the substrate enzyme type, said pre-functionalised beads able to produce a biological or biochemical reaction are enzymes, said constituent of the fluid stream is a substrate of the enzyme, and said products of the reaction are products arising from reaction of said enzyme with said substrate.

Claim 24 (Withdrawn): The process according to claim 22, wherein said reaction is an enzymatic digestion reaction by a protease, said pre-functionalised beads able to produce a biological or biochemical reaction are proteases and said constituents of the fluid stream are peptides or proteins and said products of the reaction are peptidic segments.

Claim 25 (Withdrawn): The process according to claim 24, wherein the enzyme is trypsin.

Claim 26 (New): A micro-system for receiving beads of different diameters and obtaining a precise positioning of said beads at preset locations in said micro-system, comprising:

- a tank that has a cavity which is fitted with blocking elements having the form of columns, said blocking elements allowing beads of different diameters to be blocked in interstices between said blocking elements in an ordered way, said interstices constituting said preset locations, wherein (1) said blocking elements are distributed and spatially arranged so as to obtain a positioning of the beads as a function of their diameters, (2) said blocking elements are distributed and spatially arranged to constitute wells intended to receive beads of a first preset diameter and spaces between the wells intended to receive beads of a second preset diameter, and (3) the traverse two-dimensional cross-section of the blocking elements in the cavity is larger than the traverse two-dimensional cross-section of the wells in the cavity,

- a cap hermetically sealing said tank,
- and import means and output means allowing a fluid to flow in said cavity.

Claim 27 (New): A micro-system for receiving beads of different diameters and obtaining a precise positioning of said beads at preset locations in said micro-system of Claim 26, wherein the traverse two-dimensional cross-section of each blocking element in the cavity is larger than the traverse two-dimensional cross-section of each well in the cavity.

Claim 28 (New): The micro-system according to claim 26, wherein said blocking elements are of a height that allows at least two second diameter beads to be stacked in the interstices between the blocking elements.

Claim 29 (New): A micro-system for receiving beads of different diameters and obtaining a precise positioning of said beads at preset locations in said micro-system, comprising:

- a tank that has a cavity which is fitted with blocking elements having the form of columns, said blocking elements allowing beads of different diameters to be blocked and stacked in interstices between said blocking elements in an ordered way, said interstices constituting said preset locations, wherein (1) said blocking elements are distributed and spatially arranged so as to obtain a positioning of the beads as a function of their diameters, (2) said blocking elements are distributed and spatially arranged to constitute wells intended to receive beads of a first preset diameter and spaces between the wells intended to receive beads of a second preset diameter, and (3) the traverse two-dimensional cross-section of the blocking elements in the cavity is larger than the traverse two-dimensional cross-section of the spaces between the wells in the cavity,
- a cap hermetically sealing said tank,
- and import means and output means allowing a fluid to flow in said cavity.

Claim 30 (New): A micro-system for receiving beads of different diameters and obtaining a precise positioning of said beads at preset locations in said micro-system of Claim 26, wherein the traverse two-dimensional cross-section of each blocking element in the cavity is larger than the traverse two-dimensional cross-section of each space between the wells in the cavity.

Claim 31 (New): The micro-system according to claim 29, wherein said blocking elements are of a height that allows at least two second diameter beads to be stacked in the interstices between the blocking elements.